



24-Feb-2015

Matt Villicana
Tetra Tech EM Inc.
1 South Wacker Dr
Suite 3700
Chicago, IL 60606

Re: **Olympic Antifreeze 103X90260001S051502007**

Work Order: **1502920**

Dear Matt,

ALS Environmental received 4 samples on 21-Feb-2015 01:30 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 14.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Joseph Ribar".

Electronically approved by: Joseph Ribar

Joseph Ribar
Project Manager



Certificate No: MN 532786

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

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Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Tetra Tech EM Inc.
Project: Olympic Antifreeze 103X90260001S051502007
Work Order: 1502920

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1502920-01	OA-MW-10-0219	Water		2/19/2015 13:10	2/21/2015 13:30	<input type="checkbox"/>
1502920-02	OA-S5-03-0219	Soil		2/19/2015 13:30	2/21/2015 13:30	<input type="checkbox"/>
1502920-03	OA-MH-05-0219	Water		2/19/2015 13:35	2/21/2015 13:30	<input type="checkbox"/>
1502920-04	OA-MW-10-0219-PP	Water		2/19/2015 13:40	2/21/2015 13:30	<input type="checkbox"/>

Client: Tetra Tech EM Inc.
Project: Olympic Antifreeze 103X90260001S051502007
Work Order: 1502920

Case Narrative

Samples for the above noted Work Order were received on 02/21/2015. The attached ""Sample Receipt Checklist"" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the ""Work Order Acknowledgement"". Methodologies are also documented in the ""Analytical Result"" section for each sample. Quality control results are listed in the ""QC Report"" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The ""Qualifiers"" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

GC-FID:

No other deviations or anomalies were noted.

Wet Chemistry:

No other deviations or anomalies were noted.

ALS Group USA, Corp

Date: 24-Feb-15

Client: Tetra Tech EM Inc.

Project: Olympic Antifreeze 103X90260001S051502007

Sample ID: OA-MW-10-0219

Collection Date: 2/19/2015 01:10 PM

Work Order: 1502920

Lab ID: 1502920-01

Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
ORGANIC COMPOUNDS BY GC-FID			Method: SW8015M				Analyst: KYM
Ethylene glycol	6,300		17	120	mg/L	25	2/23/2015 18:56

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 24-Feb-15

Client: Tetra Tech EM Inc.

Project: Olympic Antifreeze 103X90260001S051502007

Sample ID: OA-S5-03-0219

Collection Date: 2/19/2015 01:30 PM

Work Order: 1502920

Lab ID: 1502920-02

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
ORGANIC COMPOUNDS BY GC-FID			Method: SW8015M				Analyst: KYM
Ethylene glycol	45,000		430	570	mg/Kg-dry	100	2/23/2015 21:18
MOISTURE			Method: E160.3M				Analyst: EVB
Moisture	15		0.025	0.050	% of sample	1	2/23/2015 14:45

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 24-Feb-15

Client: Tetra Tech EM Inc.

Project: Olympic Antifreeze 103X90260001S051502007

Work Order: 1502920

Sample ID: OA-MH-05-0219

Lab ID: 1502920-03

Collection Date: 2/19/2015 01:35 PM

Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
ORGANIC COMPOUNDS BY GC-FID			Method: SW8015M				Analyst: KYM
Ethylene glycol	40,000		67	500	mg/L	100	2/23/2015 19:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 24-Feb-15

Client: Tetra Tech EM Inc.

Project: Olympic Antifreeze 103X90260001S051502007

Sample ID: OA-MW-10-0219-PP

Collection Date: 2/19/2015 01:40 PM

Work Order: 1502920

Lab ID: 1502920-04

Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
ORGANIC COMPOUNDS BY GC-FID							
Ethylene glycol	20,000		130	1,000	mg/L	200	Analyst: KYM 2/23/2015 19:22

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Tetra Tech EM Inc.
Project: Olympic Antifreeze 103X90260001S051502007
WorkOrder: 1502920

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

Client: Tetra Tech EM Inc.

Work Order: 1502920

Project: Olympic Antifreeze 103X90260001S051502007

QC BATCH REPORT

Batch ID: **R158002**

Instrument ID **GC11**

Method: **SW8015M**

MBLK		Sample ID: MB1-R158002-R158002				Units: mg/Kg		Analysis Date: 2/23/2015 09:05 PM		
Client ID:		Run ID: GC11_150223A				SeqNo: 3154190		Prep Date: 2/23/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	U	5.0								

MBLK		Sample ID: MB-R158002-R158002				Units: mg/L		Analysis Date: 2/23/2015 06:31 PM		
Client ID:		Run ID: GC11_150223A				SeqNo: 3154227		Prep Date: 2/23/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	U	5.0								

LCS		Sample ID: LCS1-R158002-R158002				Units: mg/Kg		Analysis Date: 2/23/2015 08:01 PM		
Client ID:		Run ID: GC11_150223A				SeqNo: 3154191		Prep Date: 2/23/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	432.9	5.0	500	0	86.6	50-150	0			

LCS		Sample ID: LCS-R158002-R158002				Units: mg/L		Analysis Date: 2/23/2015 05:26 PM		
Client ID:		Run ID: GC11_150223A				SeqNo: 3154228		Prep Date: 2/23/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	435.5	5.0	500	0	87.1	50-150	0			

MS		Sample ID: 1502920-02A MS				Units: mg/Kg		Analysis Date: 2/23/2015 08:13 PM		
Client ID: OA-S5-03-0219		Run ID: GC11_150223A				SeqNo: 3154198		Prep Date: 2/23/2015		DF: 200
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	85330	960	50000	38180	94.3	50-150	0			

MS		Sample ID: 1502765-02B MS				Units: mg/L		Analysis Date: 2/23/2015 05:39 PM		
Client ID:		Run ID: GC11_150223A				SeqNo: 3154237		Prep Date: 2/23/2015		DF: 2
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	958.4	10	1000	0	95.8	50-150	0			

MSD		Sample ID: 1502920-02A MSD				Units: mg/Kg		Analysis Date: 2/23/2015 08:26 PM		
Client ID: OA-S5-03-0219		Run ID: GC11_150223A				SeqNo: 3154200		Prep Date: 2/23/2015		DF: 200
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylene glycol	85180	960	50000	38180	94	50-150	85330	0.173	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Tetra Tech EM Inc.
Work Order: 1502920
Project: Olympic Antifreeze 103X90260001S051502007

QC BATCH REPORT

Batch ID: R158002 Instrument ID GC11 Method: SW8015M

MSD		Sample ID: 1502765-02B MSD				Units: mg/L		Analysis Date: 2/23/2015 05:52 PM			
Client ID:		Run ID: GC11_150223A				SeqNo: 3154240		Prep Date: 2/23/2015		DF: 2	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Ethylene glycol	935.9	10	1000	0	93.6	50-150	958.4	2.37	30		
The following samples were analyzed in this batch:			<div>1502920-01A1502920-02A1502920-03A1502920-04A</div>								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Tetra Tech EM Inc.
Work Order: 1502920
Project: Olympic Antifreeze 103X90260001S051502007

QC BATCH REPORT

Batch ID: **R158012** Instrument ID **MOIST** Method: **E160.3M**

MBLK		Sample ID: WBLKS-R158012				Units: % of sample		Analysis Date: 2/23/2015 02:45 PM		
Client ID:		Run ID: MOIST_150223C				SeqNo: 3154617		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture U 0.050

LCS		Sample ID: LCS-R158012				Units: % of sample		Analysis Date: 2/23/2015 02:45 PM		
Client ID:		Run ID: MOIST_150223C				SeqNo: 3154616		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

DUP		Sample ID: 1502876-04B DUP				Units: % of sample		Analysis Date: 2/23/2015 02:45 PM		
Client ID:		Run ID: MOIST_150223C				SeqNo: 3154598		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 14.18 0.050 0 0 0 14.5 2.23 20

DUP		Sample ID: 1502920-02A DUP				Units: % of sample		Analysis Date: 2/23/2015 02:45 PM		
Client ID: OA-S5-03-0219		Run ID: MOIST_150223C				SeqNo: 3154610		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 16.54 0.050 0 0 0 15.27 7.98 20

The following samples were analyzed in this batch:

1502920-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Environmental

Chain of Custody Form

Page ____ of ____

COC ID: 123456

☐ Cincinnati, OH
+1 513 733 5336

☐ Everett, WA
+1 425 356 2600

☐ Fort Collins, CO
+1 970 490 1511

☒ Holland, MI
+1 616 399 6070

☐ Houston, TX
+1 281 530 5656

☐ Middletown, PA
+1 717 944 5541

☐ Salt Lake City, UT
+1 801 266 7700

☐ Spring City, PA
+1 610 948 4903

☐ York, PA
+1 717 505 5280

ALS Project Manager:

Work Order #:

1502920

Customer Information			Project Information				Parameter/Method Request for Analysis											
Purchase Order		Project Name	Olympic Antifreeze		A	Ethylene Glycol Method 8015												
Work Order		Project Number	103X902600015051502007		B													
Company Name	Tetra Tech	Bill To Company	Tetra Tech Inc.		C													
Send Report To	Math Villicana	Invoice Attn.	Chris Burns		D													
Address	15. Wacker Dr.	Address	15. Wacker Dr.		E													
City/State/Zip	Chicago/IL/60606	City/State/Zip	Chicago/IL/60606		F													
Phone	(847) 708-502-1513	Phone			G													
Fax		Fax			H													
e-Mail Address	Math.Villicana@tetratech.com	e-Mail Address	Chris.Burns@tetratech.com		I													
J																		
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold	
1	OA-MW-10-0219	02-19-15	1310	Water	8	2	X											
2	OA-SS-03-0219	02-19-15	1330	Soil	8	1	X											
3	OA-MH-05-0219	02-19-15	1335	Water	8	1	X											
4	OA-MW-10-0219-PP	02-19-15	1340	Water	8	1	X											
5																		
6																		
7																		
8																		
9																		
10																		

Sampler(s): Please Print & Sign <i>Scott Ben Cordell Remer</i>		Shipment Method:		Required Turnaround Time: <input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input checked="" type="checkbox"/> 24 Hour		Results Due Date:	
Relinquished by:	Date: 2/20/15	Time: 1320	Received by:	Notes:			
Relinquished by:	Date: 2/20/15	Time: 1800	Received by (Laboratory):	Cooler Temp.			
Logged by (Laboratory):	Date: 2/23/15	Time: 0930	Checked by (Laboratory):	QC Package: (Check Box Below)			
				Level II: Standard QC			
				Level III: Std QC + Raw Data			
				Level IV: SW846 CLP-Like			
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035				Other:			

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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From: (210) 405-5409
 Peter Watson
 ALS Environmental
 3352 128th Ave
 HOLLAND, MI 49424

Origin ID: HLMA



BILL SENDER

SHIP TO: (616) 359-6078
 Sample Receiving
 ALS Environmental
 3352 128TH AVE
 HOLLAND, MI 49424

Ship Date: 20FEB15
 Actual Wt: 36.0 LB
 CND: 2264640NE73810

Dim: 11 X 20 X 14 N



Ref #
 Invoice #
 PO #
 Dept #

1 of 2

TRK# 7729 6289 9421

MASTER

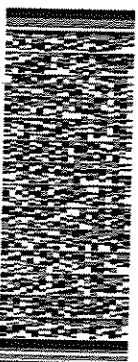
SATURDAY 12:00P
 PRIORITY OVERNIGHT

68 HLMA

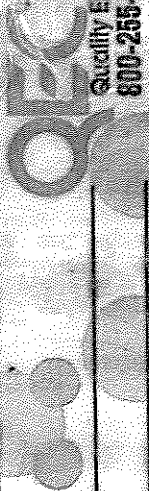
49424
 HLMS
 GRR



5742612EE4B



Quality Environmental Containers
 800-255-3950 • 304-255-310



Sample Receipt Checklist

Client Name: **TETRATECH-EM-CHI**

Date/Time Received: **21-Feb-15 13:30**

Work Order: **1502920**

Received by: **DS**

Checklist completed by Diane Shaw
eSignature

23-Feb-15
Date

Reviewed by: Joseph Ribar
eSignature

23-Feb-15
Date

Matrices: Water, Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>4.2 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>2/23/2015 10:02:39 AM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: